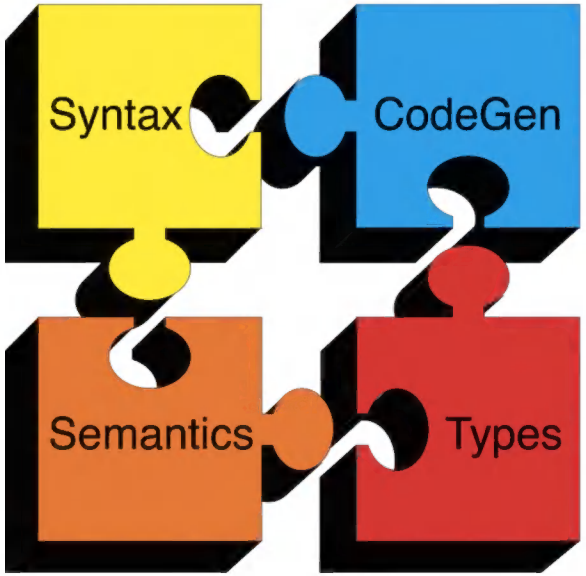

Compilers

Java Interfaces

Java Interfaces

Specify relationships between classes without inheritance

```
interface PointInterface { void move(int dx, int dy); }

class Point implements PointInterface {
    void move(int dx, int dy) { … }
}
```

Java Interfaces

"Java programs can use interfaces to make it unnecessary for related classes to share a common abstract superclass or to add methods to Object."

In other words, interfaces play the same role as multiple inheritance in C++, because classes can implement multiple interfaces

class X implements A, B, C { … }

Java Interfaces

- A graduate student may be both an University employee and a student

```
class GraduateStudent implements Employee, Student
{ … }
```

- No good way to incorporate Employee, Student methods for grad students with single inheritance

Java Interfaces

Methods in classes implementing interfaces need not be at fixed offsets.

```
interface PointInterface { void move(int dx, int dy); }

class Point implements PointInterface {
    void move(int dx, int dy) { … } }
class Point2 implements PointInterface {
    void dummy() { … }
    void move(int dx, int dy) { … } }
```

Java Interfaces

- Dispatches e.f(…) where e has an interface type are more complex than usual
  - Because methods don't live at fixed offsets

- One approach:
  - Each class implementing an interface has a lookup table method names → methods
  - Hash method names for faster lookup
    - hashes computed at compile time